

Appln. No. 10/807,088

Attorney Docket No. 10543-069

**I. Amendments to the Claims**

1. (Previously Presented) A system for estimating body states of a vehicle comprising:

a first linear accelerometer and a second linear accelerometer mounted to the vehicle in separate locations, the first and second linear accelerometers generating measured vehicle state signals corresponding to the acceleration of the vehicle in a first direction;

a third linear accelerometer and a fourth linear accelerometer mounted to the vehicle in separate locations, the third and fourth linear accelerometers generating measured state signals corresponding to the acceleration of the vehicle in a second direction;

a signal adjuster which transforms the measured vehicle states signals from a sensor coordinate system to a body coordinate system associated with the vehicle; and

a filter which receives the transformed measured signals from the signal adjuster and processes the measured signals into body state estimates of the vehicle, the body state estimates include at least of one a roll rate, a roll angle and a yaw rate.

2. (Previously Presented) The system of claim 1 wherein the filter includes a model of the vehicle dynamics and a model of the linear accelerometers, the state estimates being based on the transformed measured signals and the models of the vehicle dynamics and linear accelerometers.



BRINKS HOFER GILSON & LIONE  
PO Box 10395  
Chicago, IL 60611-5599

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3. (Previously Presented) The system of claim 1 wherein the filter includes an estimator, an algorithm being implemented in the estimator to process the transformed measured signals and the models of the vehicle dynamics and linear accelerometers and generate the state estimates.

4. (Cancelled)

5. (Previously Presented) The system of claim 1 further comprising an angular rate sensor.

6. (Cancelled)

7. (Previously Presented) The system of claim 1 further comprising two linear accelerometers that measure accelerations in a third direction.

8. (Cancelled)

9. (Previously Presented) The system of claim 1 further comprising two linear accelerometers that measure the vertical accelerations of the vehicle.

10. (Original) The system of claim 1 wherein the state estimates relate to the vehicle's lateral velocity, yaw rate, roll angle, and roll rate.



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11. (Previously Presented) The system of claim 1 wherein the signal adjuster further provides compensation for gravity biases associated with the linear accelerometers.

12. (Withdrawn) A method for estimating body states of a vehicle comprising:

generating measured vehicle state signals corresponding to the acceleration of the vehicle in a first direction with a first linear accelerometer and a second linear accelerometer set;

generating measured vehicle state signals corresponding to the acceleration of the vehicle in a second direction with a third linear accelerometer and a fourth linear accelerometer;

transforming the measured vehicle states signals from a sensor coordinate system to a body coordinate system associated with the vehicle; and

processing the measured signals into body state estimates of the vehicle, the body state estimates include at least of one a roll rate, a roll angle and a yaw rate.

13. (Withdrawn) The method of claim 12 system of claim 1 wherein the processing includes modeling the vehicle dynamics and the linear accelerometers.

14. (Cancelled)



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15. (Cancelled)

16. (Withdrawn) The method of claim 12 wherein the state estimates relate to the vehicle's lateral velocity, yaw rate, roll angle, and roll rate.

17. (Withdrawn) The method of claim 12 wherein the transforming includes providing compensation for gravity biases associated with the linear accelerometers.



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Chicago, IL 60611-5599